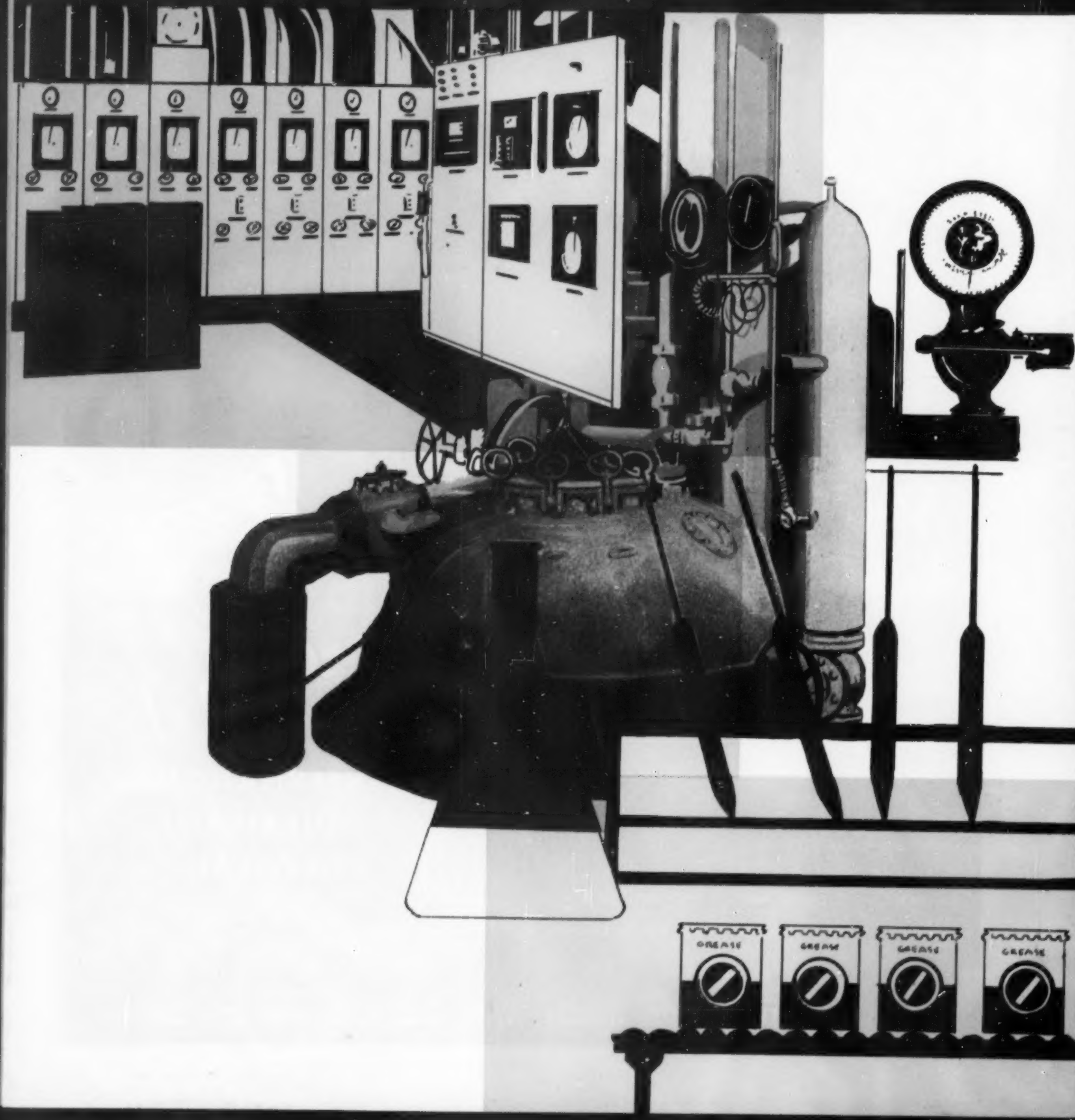
NLGI Spokesman

Journal of National Lubricating Grease Institute



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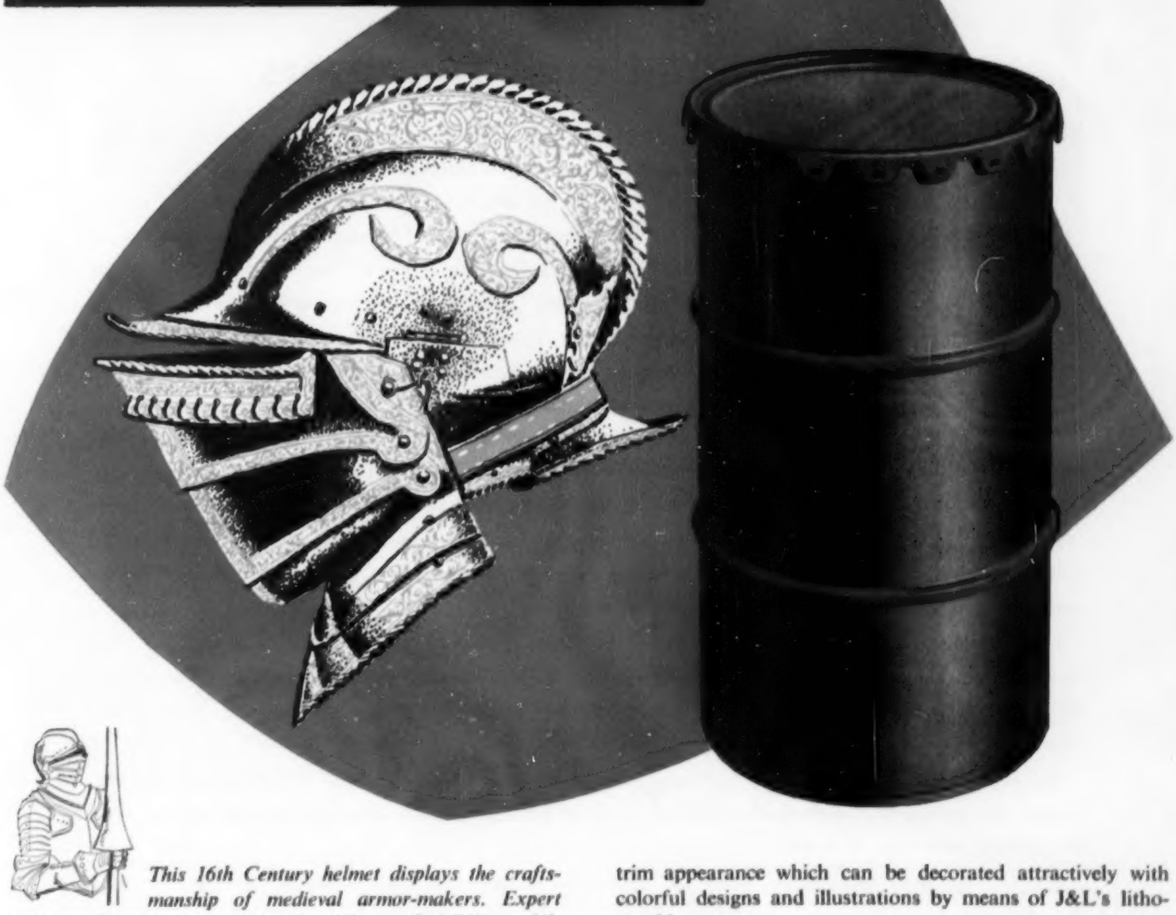

President's page

by H. L. HEMMINGWAY, President, N L G I

Our International Members

When, in 1937, the "National Association of Lubricating Grease Manufacturers, Inc." changed its name to The National Lubricating Grease Institute, no doubt the members felt that the new name would be all inclusive. Yet today, with eight active members and three technical members outside this nation, and copies of the *Spokesman* going to nearly every country in the free world, the name might more aptly be the "International Lubricating Grease Institute."

Perhaps among the highest honors that have been accorded the Institute are the unsolicited memberships that have come to us from as near as neighboring Canada and Mexico to as far as Switzerland and Japan. Our international members have supported the Institute not only by their attendance at annual meetings, and their contributions of technical papers and articles, but also by their further distribution of the *Spokesman* and publicizing of the Institute in their native lands and tongues.

Although your President is not a linguist, with the help of the gracious lady who runs the Pure Oil Company's Central Library, it has been possible to trace the derivation of the word "grease" in the native languages of some of our international members.

Our word "grease" is said to stem from the Latin "crassia" or "crassius," meaning fat. The French, Spanish, Italian and Portuguese words apparently are derived from the same source. In France, the word is "graisse" and automobile chassis lubricant is "graisse d'auto." In Spanish, it is "graso lubricante." In Italian the term is "grasso lubrificante" and in Portuguese "graxa."

Although there are no N.L.G.I. members behind the Iron Curtain, it may be of interest that the Russian for grease is "smazka," where the "s" is a prefix, "maz" is any kind of ointment or similar material and "ka" is a suffix.

Perhaps the most picturesque word for grease is the German "schmierstoffe" or literally, stuff that smears.

We are indebted to our Japanese member, Mr. Soshiro Kofune, President of the Kyodo Yushi Company, for the Japanese word which is written グリース Mr. Kofune writes: "Grease was imported and appeared in Japan in 1909 for the first time to be used as a lubricant for steel plate shearing machines of the Kure Naval Ship Yard. After that, grease began to be manufactured in Japan; therefore the name of grease in Japan came from the original word, and so it is pronounced "gurisu" (Hepburn's system of spelling), and written (as above) with Japanese letters."

Of course, no discussion of foreign terminology would be complete without mentioning how they say grease in Greece. This, somehow, proved to be the most difficult research of all, but we are reliably informed that in Greece, grease is "lipos."

It is our hope that the dedication of this page to our international members will, in a small way, indicate our gratitude for their continued interest and support of the Institute.

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IN THIS ISSUE

Page

ABOUT THE COVER

The new British-American grease plant by Roy Rinearson is the big subject in this issue. To illustrate it the author sent us a boat load of photographs illustrating expanses of gleaming floors, pillars of white piping and tanks. We gave them to artist Ronald Jones. Things started to happen after that.

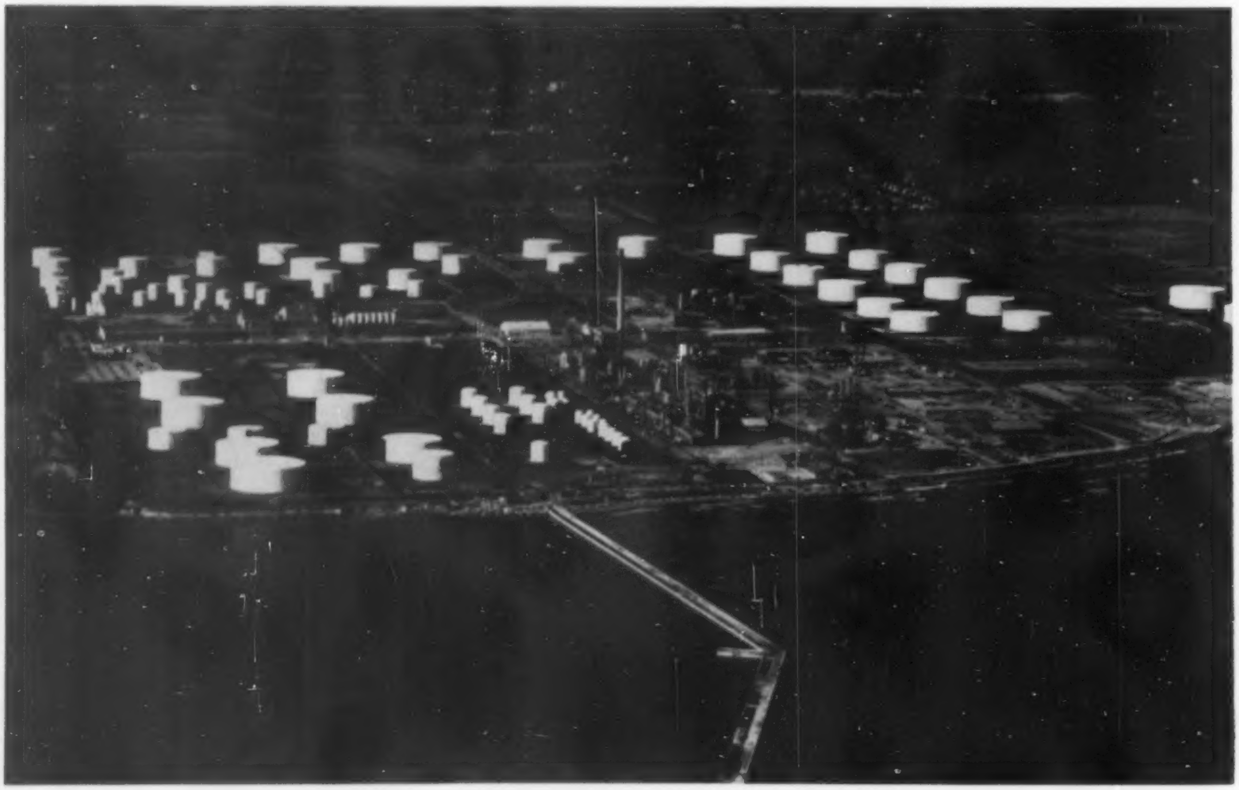
In a few days he returned with a glum look on his face. "What'er these things all about, looks like a lotta shots of a candy factory —where's the grease plant," he wanted to know.

We tried to explain and finally ended up by calling C. W. "Chuck" Nofsinger who completely designed and engineered the plant. Sure, he knew how to illustrate the plant. All we had to do was to illustrate the control panel, weigh scale dials, kettle, lab scene and packaging. "Strew some stuff like that around on the page and you'll have it, he advised."

Strewing stuff around a page is duck soup for our artist and he came up with this version of a modern grease plant.

Canada's Grease

An aerial view of Clarkson Refinery where grease plant is located.



Newest Plant

By R. O. RINEARSON

The British American Oil Company

The British American Oil Company in 1951 authorized its engineering department to proceed in the designing of a Grease Plant. Previous surveys of Canadian lubrication requirements indicated a plant capable of 15,000,000 pounds per year of production would be advisable, this production being based on a 40-hour work week.

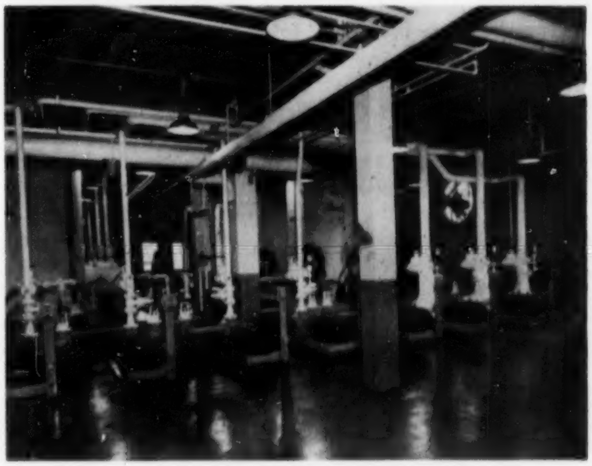
The grease plant is built within the confines of B-A's refinery at Clarkson, Ontario, which an economic survey showed to be the most logical location. The building is of concrete block construction, with laminated roof and docks. The processing section is of three-floor construction, with the filling and packaging areas being of single-floor construction.

Materials handling methods were given equal importance with that of processing equipment design in the lay-out of this grease plant. Nine tanks were located within the building as working tanks for fats and mineral oils. Five tanks are located outside the building, each having a capacity of 11,120 gallons.

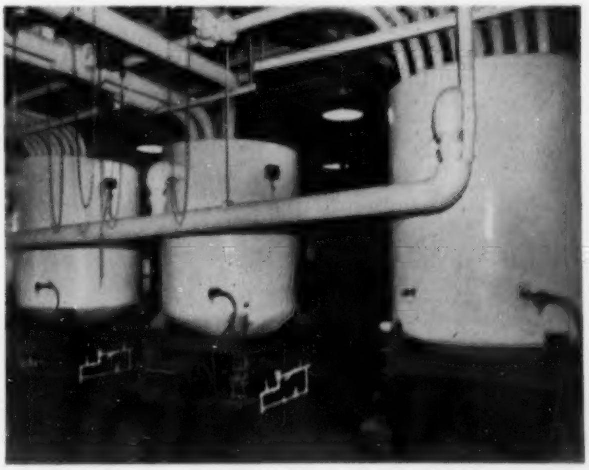
The 14 tanks servicing the grease plant each have a separate pump and line to prevent contamination. All raw materials transfer pumps are fitted with 4" suction and 3" discharge lines, with the pumps located outside the building being reversible. Material travels from the tanks through a control panel to the weigh tanks. There are no meters connected with the grease plant; all material is weighed into and out of process. Flow rate and temperature of material entering the weigh tanks, located on the third floor directly over the second-floor kettle area, are controlled from the control panel located on the second floor.

Three of the nine tanks located inside grease plant as working tanks for fats and mineral oils.

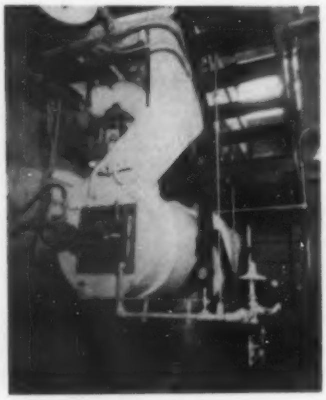
Separate pump and line for servicing each of the plant's 14 tanks without contamination.



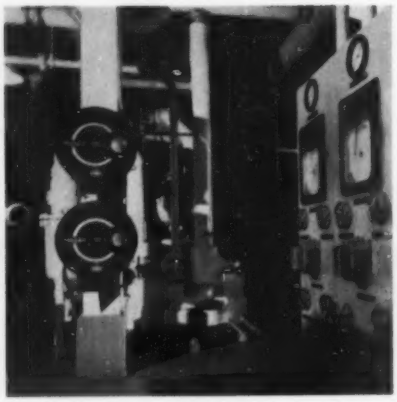
Weigh tanks are located on third floor of plant over second floor kettle area.



Heart of the processing equipment is this 6,000 lb. reactor.



Gas-Fired heater through which the hot oil system operates.



A remote set of weigh scale dials which forms part of the control panel.

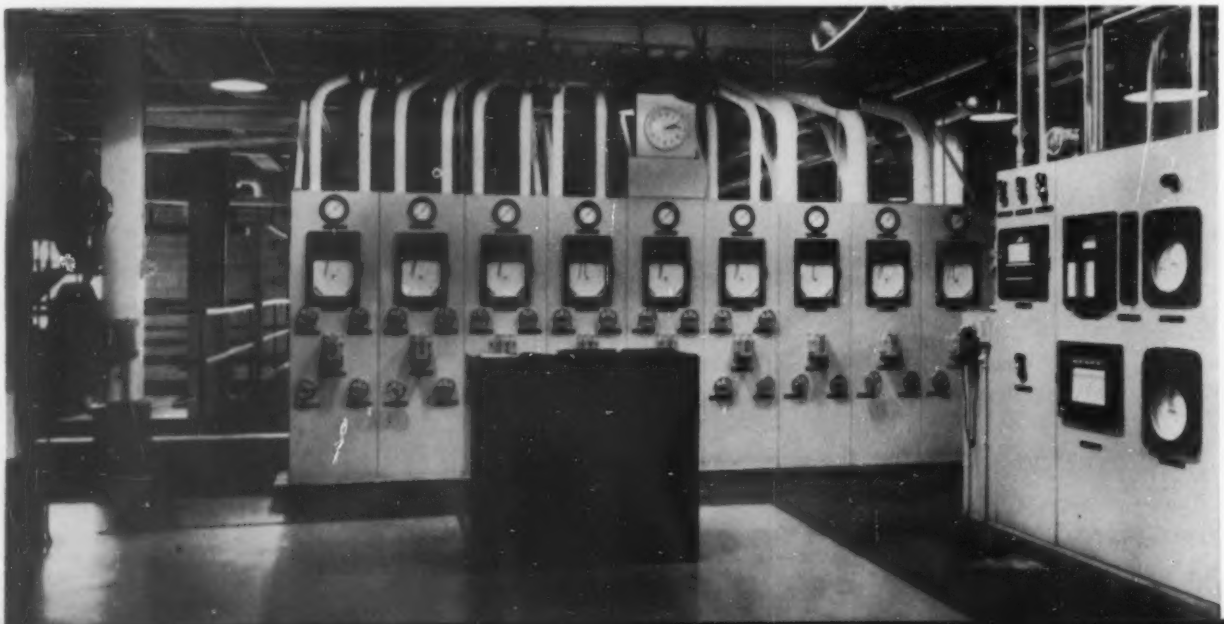
The processing area is centralized on the second floor. Specifically, this includes the kettle area, control panel, hot oil system heater, laboratory, and the dry chemical storage. The processing equipment has been designed around a 6,000-pound reactor. The reactor has been designed to operate under an internal pressure of 150 psig., or full vacuum with the heating oil pressure not to exceed 75 psig. Charging from the weigh tanks to the reactor or kettles is done by gravity through 4" lines. To support the reactor there are three finishing kettles located in the first, second and third quadrant position facing from the control panel area. The operating capacities of the three finishing kettles are 8,000, 12,000 and 15,000 pounds, respectively. They are of the double agitation, positive scraping type with multi-speed agitation features. Two are designed for either pressure or vacuum; the third is atmospheric. A ventilation system serves the kettles and general area, so that fumes or vapors are never discernible within the building.

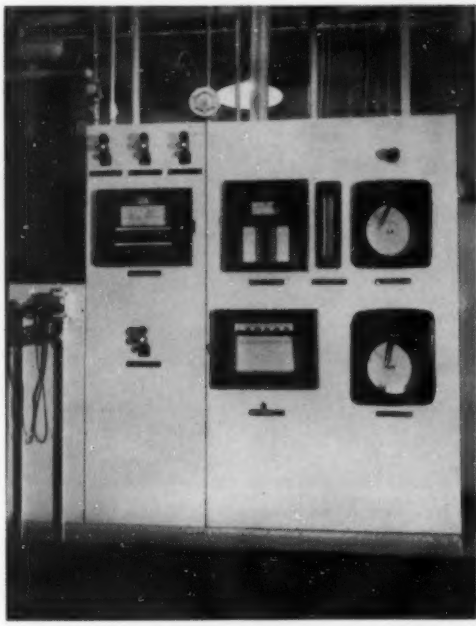
The hot oil system operates through a gas-fired heater having a normal capacity of 3,000,000 BTU/hr. A centrifugal pump operating from a 4,000-gallon hot oil surge drum circulates oil through the heater at a rate of 1500 GPM. A highly refined oil having a viscosity of 500/100° F. S.S.U. is used as the heating medium. A second pump takes suction on the hot oil surge drum and circulates hot oil through the various process kettle jackets at a rate of up to 300 GPM. Oil temperatures range up to 475° F., which necessitates oil changes at six-month intervals.

The control panel is located midway between the immediate kettle area and the hot oil furnace room. This panel controls the flow and temperature of all materials going to the weigh tanks. A remote set of weigh scale dials is a part of the control panel, which results in a condensed and efficient charging operation. Sensitive temperature indicators instantly tell the grease maker the temperatures in the various processing vessels. A four-point temperature recorder records the operating cycles of the reactor and the three finishing kettles. Various instruments control the hot oil system. High level alarm signals for the weigh tanks and run-down tank dot the board.

The laboratory is located approximately 50' from the kettle area, for convenient production control. Apparatus is available to conduct all of the generally recognized

Flow and temperature of all oils is controlled through this panel on the second floor.

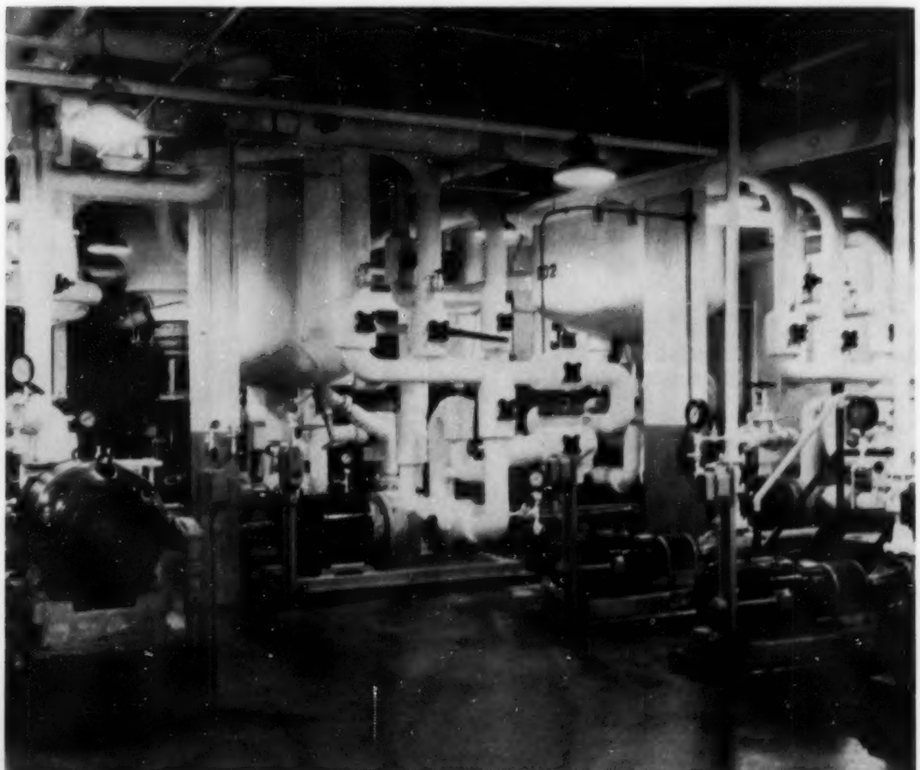




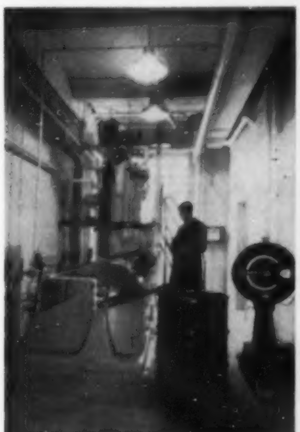
These temperature indicators record the temperatures and operating cycles of the various processing vessels.

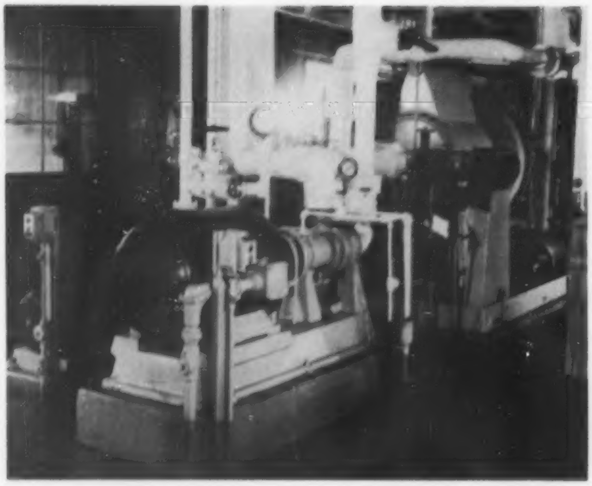
Laboratory where apparatus is available to conduct all the tests concerned with grease manufacture.

Two-speed rotary-type pumps with relief valves and filter service each kettle. On the left is the collodial mill.

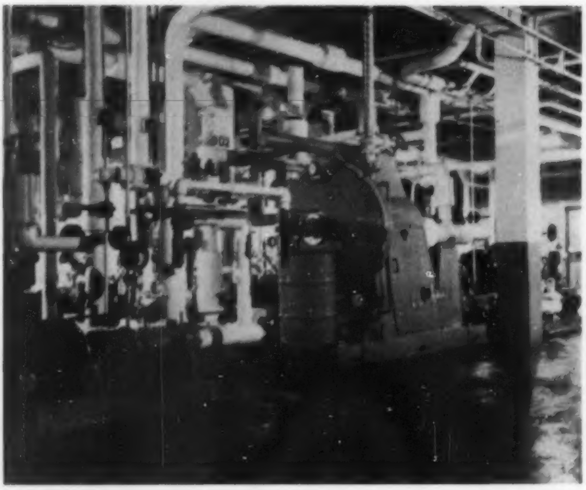


Below: Part of laboratory is this pilot plant where formulations are established.





The collodial mill (front) through which products pass through the deaerator behind.



The deaerator from which the products go to the filling lines.

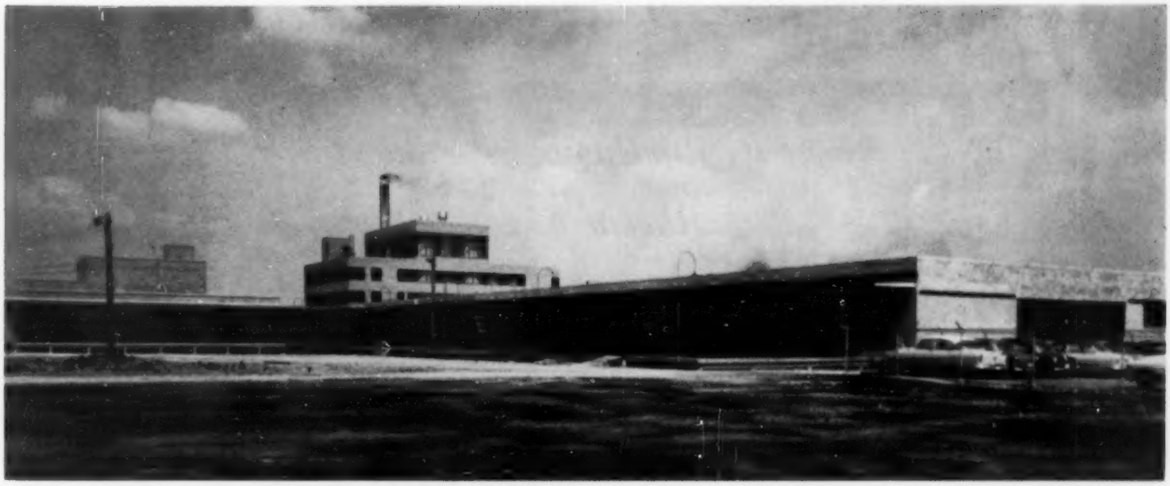
tests concerned with grease manufacture. One of the valuable features of the laboratory is the pilot plant, which is an exact replica of the main plant equipment. Formulations established in the pilot plant are processed without variation in the larger equipment.

The dry chemical storage also is directly adjacent to the kettle area.

The kettle drawing and product packaging area as previously mentioned is located on the first floor. A system of steam traced 4" lines under the kettles makes possible a highly flexible transferring operation. The contents of any kettle or the reactor can either be circulated or transferred to any one of the other kettles. Also, if necessary, a single unit can be isolated from the system to be used on special lubricants. Each kettle is serviced with a specially designed two-speed, rotary-type pump, relief valve and filter. The general kettle piping area converges through a collodial mill and thence through a deaerator. Leaving the deaerator, products are pumped to one of three filling lines.

These filling lines are manifolded in parallel positions. One line is devoted to the automatic filling, crimping and stencilling of 25-pound pails at a rate of 20 per minute. The second line automatically fills 5-and-10-pound containers at a speed of 40 per minute. The third line automatically fills, crimps and stencils 100-pound kegs up to

Filling line system which automatically fills containers from 5 lbs. to 100 lbs.



B-A's complete grease plant at the company's Clarkson refinery.

10 per minute. Four-hundred-pound drums are also filled on the third line, but this is a manual operation. The filling equipment is simple in design and highly accurate in measurement, filling to within two ounces of net weight on all sizes mentioned.

All finished products are palletized. Conveying systems are located for the most convenient and systematic unloading of empty containers, with ample dock space available both for the loading of box cars and trucks.

The primary objective in the engineering of this Grease Plant was to design a complete plant: complete in the sense that the engineering, the thinking, did not stop under the kettle but continued on through to a complete cycle of operations; a cycle embodying today's most modern processing methods with that of a highly flexible materials handling system.

At its Burlington, New Jersey, plant...
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uses just one grease

for all applications involving high load, high speed, water hazard and wide temperature variations

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ADVANTAGES OF SHELL ALVANIA GREASE:

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4. **You'll find that Shell Alvania Grease extends time between greasings . . . a substantial saving in labor and grease.**
5. **Simple inventory . . . just the one grease to stock and apply.**

Why not let us show you how Shell Alvania Grease can save time and money in your plant. Write for technical information to Industrial Lubricants, Shell Oil Company, 50 West 50th Street, New York 20, N.Y.—or 100 Bush Street, San Francisco 6, California.

SHELL ALVANIA GREASE

The True Multi-Purpose Industrial Grease

SHELL

BEARING FAILURES

in Electric Motors

By GEORGE LARSEN
Larsen-Hogue Electric Company
Los Angeles, California

Electric motor repairs necessitated by bearing failures often result in the most costly of all motor repairs. If bearings are neglected to the point of serious failure the motor rotor usually drags on the stator bore and friction causes the motor windings to burn out. Also the rotor is often damaged and requires repair or rewinding especially if it is a wound rotor or direct current armature. Also, in many cases these bearing failures cause damage to the shaft bearing surfaces requiring additional expensive repair charges. The total cost of all these repairs can easily approach the replacement cost of a new motor.

In other words, one neglected bearing can result in an expenditure for repairs alone equal to the cost of a whole new motor. When costs of loss of production are included this expense can mount to many times that of a new motor.

Those of us in the repair industry are appalled at the frequency of the neglect of both ball and sleeve maintenance in many industrial plants.

This is even more astonishing when it is realized that motor bearings are not usually difficult to maintain if a few simple principles of good maintenance practice are understood. It is probably the lack of knowledge rather than lack of desire or initiative which causes so many electric motor bearing failures.

Some of the common causes of bearing failure in electric motors are:

1. Over lubrication
2. Lack of lubrication
3. Contamination of lubricant in the bearings by foreign materials
4. Misalignment of the motor
5. Misalignment of the bearings within the motor
6. Belt or chain tension too tight.

Overlubrication, especially of ball bearings is, at least from our experience, the most prevalent. Excessive lubrication produces additional friction and consequent temperature rise of the bearing during operation. Figure No. 1 illustrates a vivid example of this frequently occurring offense. Overlubrication of the bearings also results in the motor windings becoming saturated with grease and oil which deteriorates and shortens the life of the electrical insulation eventually causing a burn out.

The results of lack of lubrication are self evident although the extent of damage from this cause is not always brought to light. Reference to Figures Nos. 2 and 3 will rather forcefully illustrate the complete destruction of both the bearing and the bearing housings resulting from lack of lubrication. In both of these instances the bearing failure also caused the motor windings to burn out.

Figure No. 4 shows the serious damage to a wound rotor caused by a bearing which allowed the rotor to rub on the stator of the motor, burning out not only the rotor winding but also the stator winding.

The sleeve bearing in Figure No. 5 is an example of bearing damage caused by improper alignment or improper installation of the bearing within the motor. In this case excessive thrust load wore the thrust collar on the shaft into the end of the bearing approximately ¼ inch.

Figure No. 6 also is illustrative of improper installation of a sleeve bearing in the motor. There is a hole in the top of the bearing into which the keeper screw is supposed to fit in order to properly position the bearing. However, when installing the bearing the keeper screw was not placed in the hole and consequently when the screw was tightened it forced the bearing down on the shaft. Obviously the bearing failed within a matter of seconds.

Many times belt and chain drives are installed with excessive tension on the belts or chain. When this occurs an additional and unnecessary load is imposed upon the bearing. While ball bearings will stand this type of abuse reasonably well because the balls and races rotate to evenly distribute the wear, a sleeve bearing will not. All of the friction wear must be absorbed over a very small angle on the circumference of the bearing. Figure No. 7 shows a split-type sleeve bearing that had failed because the belt tension was too tight. The excessive wear can be seen on the top half of the bearing which is the one on the left in the picture.

Foreign materials, such as dust, dirt, water chemicals, etc., filtering into motor bearings are a large cause of bearing failure. Water causes grease to emulsify or break up into minute individual particles which results in its losing its viscosity and lubricating qualities. Also the water subjects the bearings and bearing housings to rust. Figure No. 8 shows this emulsification action.

In concluding, it cannot be emphasized too strongly that failure of bearings in electric motors through lack of proper and regular maintenance is a contributing factor to expensive motor repairs as well as to costly interruptions in production.

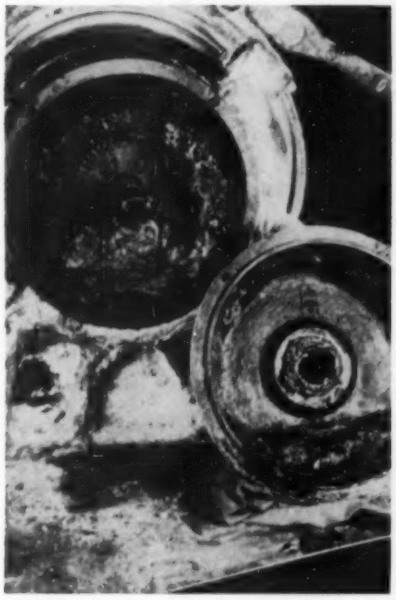


Figure 1

Figure 2

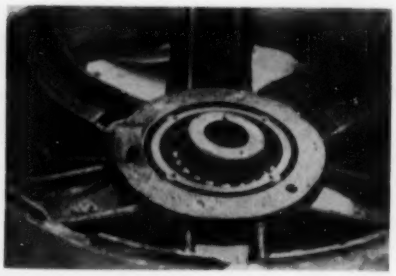


Figure 3

Far left: Figure 1—"Vivid example of over-lubrication."

Middle and above: Figures 2 & 3—"Complete destruction . . . resulting from lack of lubrication."

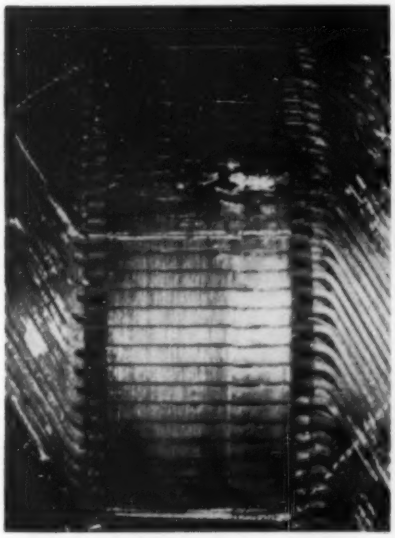


Figure 4

Figure 5

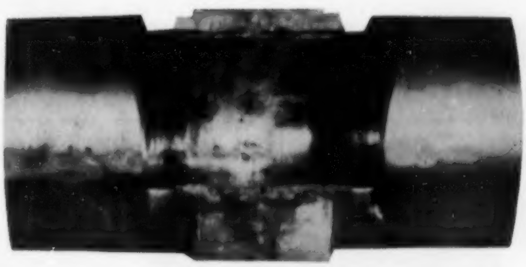


Figure 6

Far left: Figure 4—"Serious damage to a wound rotor."

Middle: Figure 5—"Example of bearing damage caused by improper alignment."

Above: Figure 6—"Improper installation of a sleeve bearing in the motor."

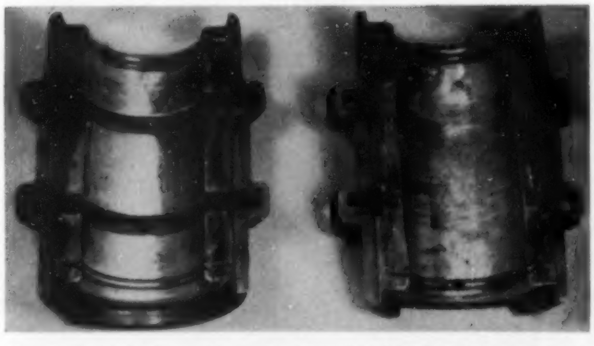


Figure 7—"Split-type sleeve bearing that had failed because the belt tension was too tight."

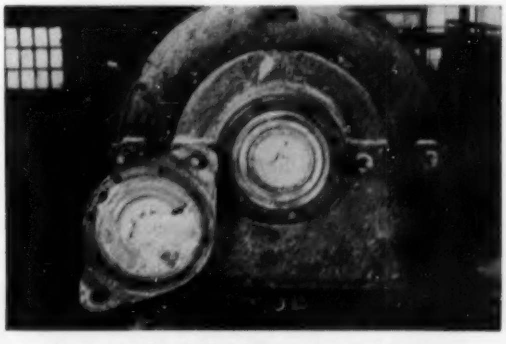


Figure 8—"Emulsification action on bearings."

Patents and Developments

Polycarboxylic Acid Soap Greases

Dicarboxylic acid soaps of metals, such as aluminum, generally are not oil soluble. However, Witco Chemical Company, in its patent 2,699,428, discloses a method whereby oil soluble bases may be prepared with such soaps, the greases claimed to be outstanding with respect to withstanding working, setting well at high temperatures, and capable of being made into a stiff grease without being grainy.

Oil soluble soaps of polycarboxylic acids may be so produced, provided such formation is carried out in conjunction with a reaction with a monocarboxylic fatty acid in which the monocarboxylic acid is in considerable excess. Suitable results have been obtained with dicarboxylic acids present in an amount of 0.5% to 25% of the total acid by weight, preferably 5-20%.

The preferred dibasic acid is sebacic. Another acid giving particularly good results is the dimer of linoleic acid, known commercially as Emery M 461-R. Other acids are adipic, pimelic, and suberic. The monocarboxylic acid also may be oleic, ricinoleic, hydroxystearic, etc.

The following example illustrates the process by this patent:

95 parts of hydrogenated herring acids and 5 parts of sebacic acid were saponified with 22 parts of caustic soda in aqueous solution. Aluminum sulphate was added in excess until the solution had a pH of 5. The solid precipitate was filtered, washed, dried and ground. (Aluminum soap "A.") 6% of this product was dissolved in a mid-Continent oil (300 S. S. U. at 100° F.) at 300° F. to form a stiff gel. For comparative purposes a similar sample was made using 100 grams hydrogenated herring acid and no sebacic acid. (Aluminum soap "B.")

Comparative penetration results of greases (at 77° F.) containing 6% of soap "A" and "B" are shown in the following table:

	Soap "A"	*Soap "B"*
Unworked	177	210
60 Strokes	284	350
5,000 Strokes	305	430

Extreme Pressure Lubricant

A lead naphthenate gear lubricant which is claimed to meet the rigorous requirements of U. S. Army Specification 2-105B for heavy duty automotive gear lubricants (now designated as MIL-L-2105) is described in U. S. Patent 2,701,237 is issued to the Texas Company.

In accordance with the patent, an extreme pressure lubricant of superior quality which meets the foregoing specification is provided by compounding with a mineral lubricating oil as the predominating or major constituent, a substantial proportion of lead naphthenate together with a combination of three different types of sulfur and chlorine-containing additives represented by (1) a sulfo-chlorinated sperm oil, (2) a chlorinated paraffin wax, and (3) a sulfurized sperm oil composition selected from the group consisting of a sulfurized mixture of mainly sperm oil and lanolin and sulfurized sperm oil. The proportions of the said three sulfur and chlorine-containing additives as well as the lead naphthenate have been found critical in satisfactorily meeting both the high speed and high torque axle tests. The formulation in accordance with the present invention thus consists essentially of a mineral lubricating oil as the predominating constituent blended with the following additives in per cent by weight based on the lubricant:

	Per Cent by Weight
Lead naphthenate	8-12
Sulfo-chlorinated sperm oil	8-12
Chlorinated paraffin wax	2.5-3.5
Sulfurized sperm oil composition	4-7.5

The mineral lubricating oil, which ordinarily constitutes about 60-78% by weight of the lubricant, is preferably a blend of a residual lubricating oil with a distillate lubricating oil to meet the desired viscosity for the particular grade of automotive gear lubricant. A preferred type of mineral lubricating oil is one from a mixed base crude which is relatively low in wax content and thus has characteristics of a naphthene base crude, but at the same time has a relatively high viscosity index and thus has characteristics of a paraffin base crude. A very satisfactory crude of this character is represented by the so-called Manvel crude. The blend of the residual oil from this crude with a distillate oil from the said crude results in improved color, stability and low temperature performance in addition to providing proper viscosity ranges for the various grades of automotive gear lubicants. In adjusting the viscosity for the various grades, the proportion of residual oil is increased while the distillate oil is concomitantly decreased as the viscosity and grade of the lubricant is raised, the proportions of the extreme pressure additives compounded therewith remaining essentially constant.

The lead naphthenate utilized in the lubricant can be prepared from naphthenic acids obtained in the refining of petroleum, particularly the naphthenic acids derived from lubricating oil fractions. Moreover, the naphthenic acids can contain some non-saponifiable mineral oil which may vary up to 30% or more. A typical lead naphthenate, prepared from lubricating oil naphthenate acids having

a non-saponifiable content of about 23%, has a PbO content of roughly about 20% by weight. Lead naphthenate prepared from naphthenic acids essentially freed from non-saponifiable content will run about 30% PbO content.

The sulfo-chlorinated sperm oil employed in the lubricant may be produced by reacting the sperm oil with about 10-15% sulfur monochloride without added heat, followed by subsequent stabilization of the reaction product by heat treatment at temperatures of about 300-350° F., followed by neutralization of any strong acidity so that the product passes the copper strip corrosion test by passing the treated oil in contact with marble chips. Or the sperm oil may be first chlorinated as by bubbling chlorine gas through the material at 150° F., and the resulting chlorinated product subsequently treated with about 10-15% of sulfur monochloride and stabilized in the foregoing manner. A preferred compound of this type for purposes of the present invention is a sulfo-chlorinated sperm oil containing about 4-6% of combined sulfur and about 4-6% of combined chlorine. A commercially available product of this character is "Sulchlor 55" sold by Carlisle Chemical Works Inc. which is a sulfurized and chlorinated sperm oil containing roughly about 5% each of combined sulfur and chlorine.

The chlorinated paraffin wax employed in this lubricant is one having a high content of combined chlorine, the major proportion of which is in a so-called active state. For example, a preferred material of this character has a total combined chlorine content of about 40-45% with an active chlorine content of about 29-34%. A commercially available product of this character is sold under the name of "Anglamol 40" by Lubrizol Corp. Preferably, the chlorinated paraffin wax contains a small proportion of an oil-soluble corrosion inhibitor of the type disclosed in U. S. Patent No. 2,298,638, which functions to neutralize the effect of any decomposition of the chlorinated paraffin wax with the release of free chlorine. "Anglamol 40" contains a small amount of phenoxy propylene oxide as a corrosion inhibitor of this type.

The sulfurized sperm oil composition employed in the present lubricant may be prepared by sulfurizing either sperm oil or a mixture of mainly sperm oil and lanolin, with about 8-15% of sulfur at 350-400° F. for about 1-3 hours. The resulting sulfurized product contains about 7-13% of combined sulfur in a form which renders the product non-corrosive in the copper strip corrosion test and yet is sufficiently active to provide the required chemical reaction at elevated temperatures which is responsible for the extreme pressure properties thereof. A commercially available prodnct of this type is sold under the name of "S/V 28 Base" by Socony Vacuum Oil Company, and is a sulfurized mixture of mainly sperm oil with a small amount of lanolin, the principal constituent being a sulfurized derivative of cetyl oleate. Typical tests on this product are the following:

Gravity, °API	14.5-16.0
SUS viscosity at 210° F.	190-230
Sulfur, weight per cent	9-11
Sap. No.	140-155

"HOYST'S CUSTOMERS HAVE TO SELL HIM ON THE IDEA OF A LUBE JOB!"

In addition to the foregoing ingredients, a small proportion of an anti-foam agent is preferably incorporated in the lubricant. A very satisfactory material of this type is a silicone polymer, such as dialkyl, diaryl or alkyl-aryl silicone polymer of known anti-foam properties. A typical material of this type is dimethyl silicone polymer having a kinematic viscosity at 25° C. of about 100-1000 centistokes. The silicone polymer is conveniently handled as a concentrate in a hydrocarbon solvent such as kerosene. In the specific examples listed hereinbelow, the concentrate was prepared by dissolving dimethyl silicone polymer in kerosene in proportion of 10 grams of the polymer with sufficient kerosene to make up to a volume of 100 ccs. The anti-foam agent, such as the silicone polymer concentrate, is employed in the lubricant in a proportion of about 0.001-0.15% by weight, preferably about 50 parts per million.

In addition to the foregoing ingredients, the extreme pressure lubricant may also contain a small proportion, preferably about 0.5-1.0%, by weight of an aliphatic dihydric or trihydric alcohol, such as glycerine, to increase the Timken test of the lubricant. Where the purpose is to meet the 2-105B specification and extremely high Timken value is not required, the patent comprehends the omission of the polyhydric alcohol and the attainment of the required extreme pressure properties which satisfy the high speed and high torque tests by a combination in proper proportions of the three sulfur and chlorine-containing additives in conjunction with lead naphthenate in the mineral lubricating oil. It will be understood that the extreme pressure lubricant may also include small proportions of known and anti-corrosive agents, pour depressants, viscosity index improvers, oxidation inhibitors, dyes and the like, which do not deleteriously affect the essential properties of the lubricant as specified above.

One claim specifies that the lubricant contain the following additives (in per cent by weight based on the lubricant):

Mixed base residual lubricating oil	13-43
Lead naphthenate as the sole metal soap	10
Mixed base distillate lubricating oil	59-28
Sulfo-chlorinated sperm oil (4-6% combined S and 4-6% combined Cl)	10
Chlorinated paraffin wax (29-34% active Cl and 40-45% total Cl)	3
Sulfurized sperm oil composition (7-13% combined S) selected from the group consisting of a sulfurized mixture of mainly sperm oil and lanolin, and sulfurized sperm oil	5
Glycerine	0.5

SATURATED ALCOHOLS

LAURYL ALCOHOLS (C_{12})
- Adol 10 Coconut oil alcohol
- Adol 11 Saturated Coconut alcohol
- Adol 12 90% Lauryl
- Adol 13 55% Lauryl
- Adol 14 62% Lauryl
- Adol 15 68% Lauryl

CETYL ALCOHOLS (C_{16})
- Adol 52 N.F. Cetyl Alcohol
- Adol 54 Cetyl Cosmetic Grade

STEARYL ALCOHOLS (C_{18})
- Adol 62-U.S.P. Stearyl
- Adol 64-Technical Grade
- Adol 68-90% Stearyl

CETYL-STEARYL
- Adol 65
- Adol 66
- Adol 63

ARACHIDYL-BEHENYL ALCOHOL (C_{20}-C_{22})
- Adol 67

BEHENYL ALCOHOL (C_{22})
- Adol 60

1, 12 HYDROXY STEARYL ALCOHOL (C_{18})
- Adol 45

UNSATURATED ALCOHOLS

STEARYL OLEYL (C_{18})
- Adol 42

OLEYL ALCOHOLS (C_{18})
- Adol 37 cloud pt. 92° F
- Adol 34 cloud pt. 85° F
- Adol 33 cloud pt. 68° F
- Adol 32 cloud pt. 64° F
- Adol 80 cloud pt. 46° F

LINOLEYL ALCOHOL
- Unadol 40

LINOLENYL ALCOHOL
- Unadol 90

ARACHIDONYL-CLUPANODONYL (C_{20}-C_{22})
- Unadol 20
- Unadol 21

ERUCYL ALCOHOL (C_{22})
- Adol 22

RICINOLEYL ALCOHOL (C_{18})
- Adol 40

Archer-Daniels-Midland company

CHEMICAL PRODUCTS DIVISION • 2191 WEST 110th ST., CLEVELAND 2, OHIO

PEOPLE in the Industry

Battenfeld Appoints New Sales Managers

T. N. BATH

CHARLES GORE

The following promotions and changes in the sales department of the Battenfeld Grease & Oil Corporation were announced recently by Mr. A. J. Daniel, President:

T. N. "Nick" Bath has been named General Sales Manager. He will direct the company's over-all sales program. Charles Gore was promoted to Sales Manager, Lubricating Grease Division, with Robert Shepherd replacing him as Southern Sales Representative. Robert Gee will continue as Sales Manager, Waterproofing Division.

Mr. Bath moves into his new position as General Sales Manager with many years experience in industry in both the sales and technical fields. Graduating from the University of Illinois with a degree in Chemical Engineering, Mr. Bath immediately embarked upon a career in laboratory testing and supervision combined with sales and sales management. Mr. Bath joined Battenfeld in 1951 in the sales department. For the past year, he has handled the dual role of Chief Control Chemist and Lubrication Engineer working closely with the sales department.

Mr. Gore has been with Battenfeld a number of years as Southern Sales Representative. Mr. Gore formerly had experience in sales management with a national retailing firm and later gained similar experience on the wholesale level. In his new position he will have charge of lubricating grease sales, working directly with Mr. Bath.

Robert Shepherd, the new Southern Sales Representative, has spent the past year working in the various departments of the Company's Kansas City Plant. Before joining Battenfeld he held a sales position with a local Kansas City firm. Mr. Shepherd will make his headquarters in Kansas City.

U. S. Steel Promotes Backes and Mullin

Edward W. Backes has been appointed manager of sales, St. Louis District, United States Steel Corporation, effective June 1. Mr. Backes will succeed Howard J. Mullin who, on the same date, will become manager of sales for U. S. Steel in the New York District. The new St. Louis manager, since 1947, has been manager of sales, railroad division, in the Chicago District.

Mr. Backes, a native of New York City, attended Pennsylvania Military College, and was graduated from Yale University in 1922. He has been with U. S. Steel since 1940. He is a member of the American Iron and Steel Institute, the American Society of Civil Engineers, and Yale Engineering Association. He is married and the father of two sons and one daughter.

Mr. Mullin, a native of Blissfield, Michigan, was graduated from Dartmouth College in 1927 and immediately joined United States Steel at Chicago. He has been with the corporation continuously throughout his business career, and has served at several cities in various capacities, principally in connection with sales and distribution. Mr. Mullin recently completed a term as director of the Iron and Steel Division, Business and Defense Services Administration, U. S. Department of Commerce, on loan from U. S. Steel. He is married and has three children.

Lincoln Engineering Appoints Carl H. Mueller and John E. Renner

CARL H. MUELLER

JOHN E. RENNER

Lincoln Engineering Company, nationally known manufacturer of Lubricating Equipment, recently announced the appointment of Carl H. Mueller as Vice President in Charge of Engineering, and John E. Renner as Vice President in Charge of Sales. Both men have been associated with the company for twenty years.

Mr. Mueller was formerly Director of Engineering and Mr. Renner, General Sales Manager.

Socony Mobil Appoints Parker

David P. Parker is being appointed manager of the Brooklyn Refinery, Socony Mobil Oil Company, Inc., effective June 1. He succeeds Dr. William L. Linton, who has been manager of the refinery since 1938 and is retiring after 35 years of service with the company.

Mr. Parker has been with the company since March, 1934, starting at its Augusta, Kansas, refinery. He was transferred to the East St. Louis, Illinois, refinery in 1938. He became manager of the technical engineering division at East St. Louis in 1947. Three years later he was assigned to Vacuum Oil Company, the company's affiliate in Britain. He served as manager during the construction and initial operations of the new refinery at Coryton, England, until July, 1954. He is presently assigned to the company's headquarters.

Mr. Parker was born in Comanche, Texas, on September 20, 1907, and attended Northwestern State, Oklahoma, where he received his BS degree in 1930, and Oklahoma A&M College, receiving an MS in 1934. Before joining the company, he was with the U. S. Gypsum Company.

Mr. Parker is married to the former Margaret Ellen Rubottom and they have three children. They live at 201 Washington Avenue, Pleasantville, N. Y.

New AIIE President Edwin L. Slagle

Edwin L. Slagle of Pittsburg, California, was recently installed as the new president of the American Institute of Industrial Engineers, at the Sixth Annual Conference in St. Louis, Mo., of the nationwide engineering group. He succeeds Donald G. Malcolm of John Hopkins University.

Mr. Slagle, works industrial engineer at the Pittsburg plant of U. S. Steel's Columbia-Geneva Division, addressed the conference stressing the future outlook for industrial engineers in the American business scene and the part AIIE must play in new industrial developments.

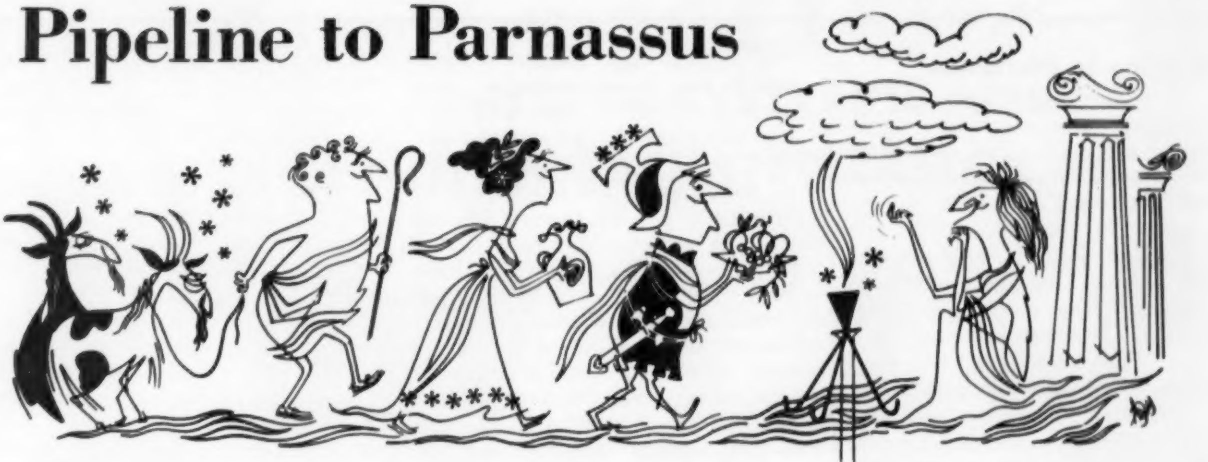
A native of Fort Wayne, Indiana, Mr. Slagle was graduated from Purdue University in 1941 with a degree in engineering. He began his career the same year as an industrial engineer with U. S. Steel's American Steel and Wire Division at Cleveland, Ohio, and was transferred to a similar position at Pittsburg Works of Columbia-Geneva in 1946. He became works industrial engineer there on October 1, 1947.

Mr. Slagle is a past president of the San Francisco-Oakland Chapter of AIIE and is a member of the Chapter's board of directors. He was co-chairman of the Pittsburg Community Chest in 1953-1954 and has been active in many community affairs, including former membership on the local USO board of directors. He is an active member of Recreation for the Blind and the Pittsburg Boys' Club.

Mr. Slagle was a U. S. Air Force pilot during World War II, serving two and one-half years as a First Lieutenant. He resides with his family at 136 E. Seventeenth Street, Pittsburg.

AIIE has 48 senior chapters throughout the United States and 26 student chapters affiliated with industrial engineering schools in universities and colleges.

Pipeline to Parnassus



The Oracle of Delphi, the most famous and influential in all ancient Greece, was run by a fortune teller who got her inspiration from a gas leak.

She lived in a gas house on the side of a mountain and Greeks bearing gifts beat a steady path to her door.

This is not gossip or irreverence, but fact, though historians say the lady was a priestess in a temple who talked with Apollo and told her gift-bearing callers what the gods had in mind for them.

Today we know better. Her Olympian pipeline, geologists have found, was nothing but gas escaping from a crack in the mountain—the same ordinary, unprophetic natural gas that is now put in man-made pipelines and used for heat and cooking in 25 million American homes.

But to the Greeks of the Ninth Century B.C. (and long after) it was a holy spirit and the chasm in the southern slope of Mount Parnassus where they found it was a holy place.

Actually, some goats got there first. They had lost their way and when the herdsman found them they were cutting up in a silly, ungoat-like manner. Going near them he felt dizzy and lightheaded. There was nobody there and nothing he could see, hear, feel, taste or smell.

He raced into town and told his neighbors about it. They followed him back and got the same giddy feeling. Then the wise men and graybeards came to scorn—and remained to marvel and wonder and hail it as a godly manifestation.

Afterwards they built a temple over the place and dedicated it to Apollo. A priestess moved in and established (or so she said) a line of communication with the god.

She was a smooth operator. Whatever anyone wanted to know she was a Greek who had words for it—straight from the divinity's mouth.

The great and small came from Hellas and its isles to consult her and exchange rich gifts and treasures for an earful of Delphian hokum. They found her sitting on a tripod over the opening in the ground from which rose the holy vapor and with it (they believed) the words of divine revelation and prophecy.

Naturally, she was the only one who heard the words that weren't there and she repeated them slowly as they came to her.

The historians say they were obscure and ambiguous. This much is certain. The fortune teller-priestess had her own system of double talk and she fooled everyone with it regularly. There were two sides to every answer and one was always right.

On a classic occasion, a warrior going into battle wanted to know if he were about to die. She took a sniff of gas and said:

"Thou shalt go and return, not dying in the war."

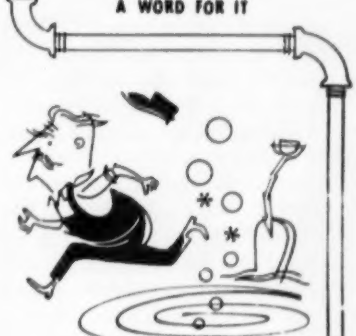
Or was it:

"Thou shalt go and return not, dying in the war?"

Either way she couldn't miss—and she never did tell where the comma went.

Continued on page 28

A WORD FOR IT



FREDONIA....1821

MR. BUNSEN'S BURNER

Industry NEWS

Pipeline to Parnassus

Continued from page 27

People today would say she was sitting pretty. She had a good thing while it lasted and it lasted for centuries (though not with the same priestess, of course).

Long after the birth of the Christian era the oracle was looted by disbelieving Phoenicians. The elegant gas house was demolished and the last of the Parnassus fortune tellers put out of business. Only the gas remained.

And what the ancient Greeks didn't know about it the ancient Chinese did. Away back when they were hearing what Confucius say with their own ears, the Chinese were pipelining natural gas through hollow bamboo and using it to evaporate brine for salt.

In all antiquity, only the Chinese found a place for gas in industry. Some contemporaries, like the Greeks, worshipped it as a supernatural power. Others were awed and frightened by flaming gas streaking from inside the earth.

Even after the gas industry had been established here, the fears remained. Less than 100 years ago, nearly every town in Western Pennsylvania had a law forbidding the use of gas for fuel or other domestic purposes—in the belief the earth was saturated with it and that once it caught fire the whole place would burn up.

In other, less fearful communities, people deliberately burned it as useless.

But the industry was on its way before that and afterwards it grew in size and usefulness until now it is our sixth largest.

Gas got its name in the 17th Century—from the German word geist and the old English word gast, both meaning ghost.

As early as 1802, the streets of Genoa, Italy, were lighted by it.

In 1821, at Fredonia, N. Y., a well digger laid down his shovel after seeing bubbles in the water. A neighbor picked up where he left off and brought in the first gas well. It was 27 feet deep and the gas—piped through hollow logs—lighted up the town for years.

A century ago Robert Wilhelm Von Bunsen, a German scientist, gave the modern world its first gas for heating (thousands of years after the Chinese) when he mixed the gas with air and invented the Bunsen burner.

In 1872, gas was moved through wrought iron pipe from Newton, Pa., to Titusville, five and a half miles away.

But long-distance transmission and natural gas for the millions didn't come till the 1920's and the development of high strength steel pipe and new methods of welding. In 1927, the longest pipeline was 300 miles. In 1931, one stretched 1000 miles from Texas to Chicago.

Today, more than 400,000 miles of pipelines—a greater milage than all the railroads in the United States—carry gas from vast underground reservoirs to America's homes and factories.

It cannot, as the Greeks thought, foretell the future.

It can only make it a better time to live in.

Socony Mobil Oil Company, Inc. New Name for Socony Vacuum

Shareholders of Socony-Vacuum Oil Company, Inc., voted at their anual meeting to change the company's corporate name to Socony Mobil Oil Company, Inc.

The new name, which is expected to become effective tomorrow after the necessary papers are filed at Albany, was approved by about 99 per cent of the shares voted. The change was recommended by the board of directors, after extensive surveys, to link the corporate name more closely with the Mobil brand products the company sells. The old name was adopted after the merger in 1931 of the Standard Oil Company of New York (Socony) and the Vacuum Oil Company.

Oil Industry Leads

The U. S. oil industry provides work for nearly 1,650,000 persons. Not only that, it leads all other U. S. industries in granting "fringe" benefits to its workers.

This was revealed by an American Petroleum Institute study entitled "Oil's Expanding Job Market," just released. The survey was conducted to assess the impact of the oil industry's rapid postwar progress upon its labor force and to reveal how petroleum compared with other U. S. industries in such things as average weekly earnings, seasonal fluctuations, and "fringe" benefits.

The figure of 1,650,000 oil workers currently employed represents an increase of 440,000 since 1946. One out of every 38 U. S. workers is employed by the petroleum industry. The figure rises to one out of every 34 if agricultural workers are excluded.

The API study points out that an uncounted additional number of American workers earn their livelihood in jobs that support the petroleum industry's activities. Similarly, an indefinite number of consumer-goods workers are today gainfully employed because petroleum's manpower can buy more.

Continued on page 31

Pipeline to Parnassus

Continued from page 28

Average weekly earnings rose 70 per cent from 1946 to 1953, with purchasing power rising 20 per cent. Refining workers averaged $2.31 per hour in 1953, as compared to a nationwide industrial average of $1.77. The average refining worker earned $94.19 a week and the average petroleum production employee $90.39. The national maufacturing industry average is $71.69.

The average petroleum industry workweek as revealed by the API survey, ranged from 40.0 to 41.1 hours weekly. At the same time, varying petroleum requirements, balancing themselves out over the months, virtually eliminate drastic seasonal fluctuations.

The safety record of the petroleum industry has improved by 35-40 per cent over 1946. In 1953, there were only nine disabling injuries for every million hours worked.

The API concludes that "the long-run factors underlying petroleum's manpower expansion are encouagingly stable. The requirements of military defense and better peacetime living," the Institute says, "should keep the petroleum industry's employment role growing for some time to come."

American and British Engineers Hold Joint Conference

Great Britain's Institution of Mechanical Engineers will join hands with The American Society of Mechanical Engineers in sponsoring a joint conference on combustion.

The Conference will be held in the United States, June 15-17, 1955 on the campus of the Massachusetts Institute of Technology, Cambridge, Massachusetts, and in England, October 25-27, 1955 in the Great Hall of the Institution of Civil Engineers in London.

The objects of the Conference are:

(a) to link theory and practice in the sphere of combustion by presenting the results of theoretical work to practical engineers in America, Great Britain and other countries;

(b) to provide an opportunity for the practical engineers in these countries to get together to discuss practical applications of theory in the fields of boilers, furnaces, internal combustion engines, and gas turbines.

The Conference will center around 40 papers to be presented under five sections: general, boilers, industrial furnaces, internal combustion engines, and gas turbines. Independent discussion of the same papers will be conducted at both Cambridge, Mass., and London.

The Conference on June 15-17 at Cambridge, Mass., will tie in with ASME's Diamond Jubilee Semi-Annual Meeting to be held in Boston the following week. The theme of the latter meeting is "The Engineer and the World of Science," one of a number of subjects being considered by the Society during its 75th Anniversary year.

It is expected that, in addition to a number of engineers from Canada, 45 British engineers and scattered representation from Australia, Germany, Italy, France, and the Netherlands will attend the Joint Conference on Combustion in Cambridge.

ASME and the Instiution of Mechanical Engineers of Great Britain have co-operated extensively in many areas over the past 75 years. This is the second of a series of similar type international conferences held jointly by ASME and IMechE. The first was held in 1951 on the subject of Heat Transfer. Other subjects are being considered for future international conferences.

Chairmen of the organizing committees are: for Great Britain—Professor O. A. Saunders, a member of the Council of the Institution of Mechanical Engineers; for the United States—H. C. Hottel, a member of ASME and Professor of Fuel Engineering, Chemical Engineering Department, Massachusetts Institute of Technology.

Persons interested in attending the Conference should write to Mr. A. D. Blake, ASME, 29 West 39th Street, New York 18, New York.

★

There can be billions of different hydrocarbons in crude oil. Petroleum research men have the staggering job of finding out which of all the billions of possible hydrocarbon combinations exist in a particular sample.

Midwest Research Develops Code Library

Midwest Research Institute has announced the development of an extensive code library which will greatly enhance the speed and economy with which engineering computations can be completed in the Institute's Computing Laboratory, and which virtually enables them to offer "mail order" service.

In making the announcement, Dr. Sheldon Levy, Manager, Applied Physics Division, noted that while electronic calculators have enormous capabilities, the extent to which these capabilities have been employed has often been curtailed by prohibitive coding costs. A complex calculation may take only minutes to perform but the process of coding prior to the calculation may take days, weeks, or months. In such cases, "one-time," lengthy, computations are often not economically handled by a computer.

Once a code is prepared for a particular engineering problem, however, no further coding is required. Midwest's solution to the high cost of coding was to establish a code library containing the computers instructions for a wide variety of problems in chemical, civil, electrical and mechanical engineering. With this system, according to Dr. Levy, the client need pay only for the actual time spent in calculation on the calculator, plus a nominal per cent which is credited to the development of the code library. And with each new problem completed, new codes are added to the library. Further, the expertness with which a code is prepared also determines the cost of the actual calculations. All the experience and skills of Midwest's engineering analysts and applied mathematicians have been utilized in preparing these library codes. As a result, the calculations are made in the most accurate and rapid manner.

The Midwest Research Institute Computer Laboratory includes two major types of electronic computers: an electronic high-speed digital computer, capable of handling a wide variety of technical and scientific calculations, and the McIlroy Pipeline Network Analyzer, a special-purpose analog computer used to obtain immediate displays of flow conditions in complex pipe networks carrying water, gas, oil and other fluids. The latter, Dr. Levy noted, is one of the few available anywhere in the nation on a consulting basis.

Some examples of projects which have been undertaken at the Computer Laboratory include frame calculations in structural design, heat-flow calculations, material balance in regenerative chemical processes, piping flexibility under conditions of high temperatures and high pressures, electrical network analysis, servo-stability determination, and water distribution studies.

Continental and Southwest to Host Petroleum Packaging Committee

On June 7th and 8th Southwest Grease and Oil Company and Continental Oil Company will be hosts to the Petroleum Packaging Committee of The Petroleum Packaging Institute which will hold its Annual Spring Meeting in Wichita, Kansas on June 7th and 8th.

Southwest's Executive Vice-President, H. A. Mayor, Jr. has announced some of the anticipated high-lights of the program. One of them is a paper by Mr. C. E. Smith, Jr. of Humble Oil and Refining Company describing a method to fill motor oil cans to a predetermined exact quantity. Another item Mr. Mayor believes of considerable importance is a progress report from Mr. Fred Beck, Chairman of the Subcommittee on Shipping Cases.

Mr. Beck's report is based upon a survey of 25 users of shipping cases for 1 quart motor oil cans which showed a wide variance in dimensions of cases, although can sizes were uniform. Eleven companies were found to be receiving cans in bulk and the cases they used for packing cans after filling is different in inside dimensions for each company. Another eighteen companies were reported as receiving cans in reshipper cases. The cans were filled and repacked in the case in which the empty cans were received. Among these eighteen companies cases of different dimensions were used. A reported effort is being made to get an agreement on cases of two dimensions. One for packing cases received in bulk and the other for cans received in shipping cases.

Another report that seems to be of interest will be made by the Subcommittee on Government-Industry packaging on tests which have been made on shipping cases manufactured from various materials. This report will also include cases of different types of construction and cover tests that have been underway for many months at the Bayonne Naval Research Facility.

An added attraction is being offered in the way of an inspection trip through the plants of Southwest Grease and Oil Company at Wichita, Kansas and Continental Oil Company at Ponca City, Oklahoma.

In addition progress reports will be made by Subcommittee Chairmen on: Government-Industry Packaging, Metal Drums and Pails, Oil Cans, Shipping Cases, New Packaging Materials and Packages, Labels and Markings on Packages, Box Car Loading Procedures, Fire and Safety Regulations in Warehousing Packages and Publicity and Future Programs.

Reports by Study Groups will be made on: Optimum filling speeds for cans, Mixed lithography and how to overcome it, Correct level of fill for cans.

Synthetic Products Builds Addition

A 30,000 square foot addition to the present Synthetic Products Company plant, Cleveland, Ohio, is now under construction, to increase the manufacturing and warehouse area, George J. Chertoff, president of the company, announced.

The plant expansion was made necessary for the development of new and improved vinyl heat and light stabilizers for the vinyl plastic industry, and the increased list of products of stearates and specialties.

At the same time, Garry B. Curtiss, vice president and general manager, disclosed the expansion of SYNPRO's technical service department, to handle the heat and light stability problem more effectively and efficiently. Raymond J. O'Hara is chief chemist in charge of the Vinyl Stabilization division.

Synthetic Products has been a pioneer in the commercial production of stearates for over 33 years. The present plant manufactures metallic stearates, featuring aluminum, barium, cadmium, calcium, lead, lithium, magnesium and zinc.

The Stabilizer division produces vinyl heat and light stabilizers, featuring barium, cadmium, tin, alkyl and aryl phosphites. SYNPRO began the manufacture of vinyl plastic stabilizers in 1945.

Synthetic Products Company is located at 1636 Wayside Road, Cleveland 12, Ohio.

Technical Committee

Chairman T. G. Roehner, Director of the Technical Service Department, Socony-Vacuum Laboratories

Mr. M. L. Carter of Southwest Grease & Oil Co., Inc. has agreed to serve as chairman of the committee for the symposium on "Lubricating Greases for Modern Farm Machinery." The Program Committee for the Annual NLGI Meeting in October has assigned a half-day session to this subject. According to present plans, the symposium wil serve as a forum for presentation of viewpoints of manufacturers of farm machinery, dispensing equipment manufacturers, as well as lubricating grease manufacturers and marketers. Mr. Carter is currently recruiting members for his committee who will handle the details of the many steps involved, starting with selection of the speakers—to editing of the papers and discussions for publication in the NLGI Spokesman after the meeting. Suggestions regarding speakers, organization of the discussion period, arrangements for publicity, etc. should be sent direct to Mr. Carter at the following address:

Mr. M. L. Carter
Southwest Grease & Oil Co., Inc.
220 West Waterman Street
Wichita 2, Kansas

Mr. N. Marusov of Gulf Research & Development Company has accepted the chairmanship of the committee to organize the panel discussions on Flow Properties of Lubricating Greases. A half-day session of the Annual Meeting has already been assigned to this panel by the Program Committee. The extent of the interest in this subject is indicated by the fact that four offers for key papers were received before a chairman had been named for the committee. These papers vary from presentations of original basic data to case histories, illustrating the importance of an understanding of the factors influencing flow properties in practical applications. Suggestions regarding organization of the panel discussion should be sent direct to:

Mr. N. Marusov
Gulf Research & Development Co.
P. O. Drawer 2038
Pittsburgh 30, Pennsylvania


THE
GUIDE
NLGI
POST
Industry
CROSSROADS
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FUTURE MEETINGS of the Industry

JUNE, 1955

6-10 American Petroleum Institute (Division of Production mid-year committee conference), Brown Palace Hotel, Denver, Colo.

6-15 Fourth World Petroleum Congress, Rome, Italy

7-8 Petroleum Packaging Committee of the Packaging Institute, Broadview Hotel, Wichita, Kansas

7-9 National Oil Scouts & Landmen's Assn. (32nd annual convention), Banff Springs Hotel, Banff, Canada

8-9 American Petroleum Institute (OIIC meeting), Wm. Penn Hotel, Pittsburgh, Pa.

9-10 Pennsylvania Grade Crude Oil Association (annual meeting), Wm. Penn Hotel, Pittsburgh, Pa.

11-15 Petroleum Equipment Suppliers Assn. (annual meeting), Banff Springs Hotel, Banff, Canada

12-15 American Society of Agricultural Engrs. Illini Union (annual meeting), University of Illinois, Urbana, Ill.

12-17 SAE Golden Anniversary (Summer meeting), Chalfonte Haddon Hall, Atlantic City, N. J.

15-17 Institute of Mechanical Engineers of England and American Society of Mechanical Engineers (joint conference), MIT campus, Cambridge, Mass.

19-21 Northwest Petroleum Association (Summer conference), Point Lodge, Pequot Lakes, Minn.

20-23 American Society of Mechanical Engineers (semiannual meeting), Statler Hotel, Boston, Mass.

26 to July 1 ASTM Committee D-2, Petroleum Products and Lubricants, Chalfonte Haddon Hall, Atlantic City, N. J.

27 to July 1 American Institute of Electrical Engineers (Summer Meeting), New Ocean House, Swampscott, Mass.

JULY, 1955

19-21 American Petroleum Institute (Committee on Agriculture annual business meeting and field trip), Oregon State College, Corvallis, Ore.

AUGUST, 1955

15 American Petroleum Institute (OIIC Steering Committee meeting), Traymore Hotel, Atlantic City, N. J.

15-17 Society of Automotive Engineers (West Coast meeting), Hotel Multnomah, Portland, Ore.

15-19 American Institute of Electrical Engineers (Pacific general meeting), Butte, Mont.

21-26 National Congress of Petroleum Retailers, Inc. (9th Annual Session), Sheraton-Cadillac Hotel, Detroit, Mich.

30-31 Petroleum Packaging Committee of the Packaging Institute, Royal York and King Edward Hotels, Toronto, Canada

SEPTEMBER, 1955

8-9 American Petroleum Institute (OIIC meeting), Conrad Hilton Hotel, Chicago, Ill.

12-15 Society of Automotive Engineers (tractor meeting), Hotel Schroeder, Milwaukee, Wis.

13-15 National Petroleum Association, Atlantic City, N. J.

14-16 National Petroleum Association (53rd annual meeting), Traymore Hotel, Atlantic City, N. J.

22-23 Mid-Continent Oil & Gas Assn. (La.-Ark. Division annual membership meeting), Roosevelt Hotel, New Orleans, La.

26-27 Independent Oil Compounders Assn. (annual meeting), Hotel Bismarck, Chicago, Ill.

25-28 American Institute of Chemical Engineers, Lake Placid Club, Lake Placid, N. Y.

27-28 Ohio Petroleum Marketers Association Fall Conference and Golf Tournament, Netherland Plaza Hotel and Maketewah Country Club, Cincinnati, Ohio

OCTOBER, 1955

2-5 AIME Petroleum Branch (Fall meeting), Roosevelt Hotel, New Orleans, La.

2-6 ASTM Committee D-2, Petroleum Products and Lubricants, Statler Hotel, Washington, D. C.

3-7 American Institute of Electrical Engineers (Fall general meeting), Morrison Hotel, Chicago, Ill.

9-15 American Petroleum Institute Oil Progress Week

11-15 Society of Automotive Engineers, Hotel Statler, Los Angeles, Calif.

12-13 South Dakota Independent Oil Men's Assn., Mitchell, S. D.

18-22 National Safety Council (43rd National Safety Congress and Exposition), Chicago, Ill.

24-26 American Standards Assn. (annual meeting), Sheraton Park Hotel, Washington, D. C.

27-29 Rocky Mountain Oil & Gas Assn. (annual convention), Cosmopolitan Hotel, Denver, Colo.

31 to Nov. 1 Independent Petroleum Assn. of America (annual membership meeting), Jefferson Hotel, St. Louis, Mo.

31 to Nov. 2 NLGI ANNUAL MEETING, EDGEWATER BEACH HOTEL, CHICAGO, ILL.

31 to Nov. 2 Society of Automotive Engineers (transportation meeting), Chase Hotel, St. Louis, Mo.

NOVEMBER, 1955

2-4 Society of Automotive Engineers (diesel engine meeting), Chase Hotel, St. Louis, Mo.

9-10 Society of Automotive Engineers (fuels and lubricants meeting), Bellevue-Stratford Hotel, Philadelphia, Pa.

13-18 American Society of Mechanical Engineers (75th anniversary meeting), Hilton & Blackstone Hotels, Chicago, Ill.

14-17 American Petroleum Institute (35th annual meeting), Mark Hopkins, Fairmont, St. Francis, and Palace Hotels, San Francisco, Calif.

16 American Petroleum Institute (OIIC Steering Committee meeting), San Francisco, Calif.

17 National Industrial Conference Board (general session), Bellevue-Stratford Hotel, Philadelphia, Pa.

27-30 American Institute of Chemical Engineers (annual meeting), Statler Hotel, Detroit, Mich.

DECEMBER, 1955

6-7 Petroleum Packaging Committee of Packaging Institute, Benjamin Franklin Hotel, Philadelphia, Pa.

8-9 American Petroleum Institute (OIIC meeting), Waldorf-Astoria Hotel, New York, N. Y.

11-14 American Society of Agricultural Engineers (Winter meeting), Edgewater Beach Hotel, Chicago, Ill.

JANUARY, 1956

9-13 SAE Annual Meeting, Sheraton-Cadillac Hotel and Hotel Statler, Detroit, Mich.

APRIL, 1956

18-20 National Petroleum Association, Cleveland, Ohio

JUNE, 1956

3-8 SAE Summer meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

SEPTEMBER, 1956

12-14 National Petroleum Association, Atlantic City, N. J.

NOVEMBER, 1956

1-2 SAE National Diesel Engine Meeting, Drake Hotel, Chicago, Ill.

8-9 SAE National Fuels and Lubricants Meeting, The Mayo, Tulsa, Okla.

APRIL, 1957

16-18 National Petroleum Association, Cleveland, Ohio

SEPTEMBER, 1957

11-13 National Petroleum Association, Atlantic City, N. J.

APRIL, 1958

16-18 National Petroleum Association, Cleveland, Ohio

SEPTEMBER, 1958

10-12 National Petroleum Association, Atlantic City, N. J.

NLGI Associate and Technical Me

CONTAINER AND CLOSURE MANUFACTURERS

Bennett Industries, Inc.
Peotone, Illinois
Representative—S. A. Bennett

Central Can Company
2415 West 19th St., Chicago 8, Illinois
Representative—Henry Frazin

Continental Can Company, Inc.
629 First National Bank Bldg., Omaha, Neb.
Representative—T. A. Graham

Geuder, Paeschke & Frey Company
324 North Fifteenth St., Milwaukee 1, Wis.
Representative—Neil Savee

Inland Steel Container Company
6532 South Menard Ave., Chicago 38, Ill.
Representative—Robert J. Greenebaum

Jones & Laughlin Steel Corporation
Container Division
405 Lexington Ave., New York 17, N. Y.
Representative—Jerry Lyons

National Steel Container Corp.
6700 South LeClaire Ave., Chicago 38, Ill.
Representative—Henry Rudy

The Ohio Corrugating Company
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Rheem Manufacturing Company
477 Madison Ave., New York 22, New York
Representative—F. J. Blume

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Trilla Cooperage, Inc.
2524 Blue Island Ave., Chicago 8, Ill.
Representative—Lester Trilla

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Division, United States Steel Company
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Representative—Wm. I. Hanrahan

Vulcan Stamping & Mfg. Co.
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1826 Diversey Parkway, Chicago 14, Illinois
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United States Air Compressor Co.
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Representative—C. A. Bening

MARKETING ORGANIZATIONS

California Texas Oil Company, Ltd.
551 Fifth Ave., New York 17, New York
Representative—Hal U. Fisher

Canadian Petrofina Limited
1015 Beaver Hall Hill
Montreal, Quebec, Canada
Representative—M. E. Wight

REFINERS

Farmers Union Central Exch., Inc.
P. O. Box G, St. Paul 1, Minnesota
Representative—H. F. Wagner

Mid-Continent Petroleum Corp.
Mid-Continent Bldg., P. O. Box 381, Tulsa, Okla.
Representative—J. W. Basore

Valvoline Oil Company
Division of Ashland Oil & Refining Co. Box G
Freedom, Pennsylvania
Representative—D. A. Smith

SUPPLIERS OF EQUIPMENT FOR MANUFACTURING LUBRICATING GREASES

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1543 Fillmore Ave., Buffalo 11, New York
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Chemicolloid Laboratories, Inc.
30 Church St., New York 7, New York
Representative—David F. O'Keefe

The Girdler Company
A Div. of National Cylinder Gas Co. Box 987
Louisville 1, Kentucky
Representative—J. E. Slaughter, Jr.

Manton-Gaulin Mfg. Co., Inc.
44 Garden Street
Everett 49, Massachusetts
Representative—G. W. Eldridge

Morehouse Industries
707 Henry Grady Building, Atlanta 3, Georgia
Representative—George E. Missbach

The C. W. Nofsinger Company
906 Grand Ave., Kansas City 6, Missouri
Representative—C. W. Nofsinger

Stratford Engineering Corporation
1414 Dierks Bldg., Kansas City 6, Missouri
Representative—D. H. Putney

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Representative—W. C. Hardesty

American Cyanamid Company
30 Rockefeller Plaza
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Archer-Daniels-Midland Company
Chemical Products Division, 2191 W. 110th St.
Cleveland 2, Ohio
Representative—Frank C. Haas

Armour & Co., Chemical Division
1355 West 31st St., Chicago 9, Illinois
Representative—H. F. Whitler

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120 Broadway, New York 5, New York
Representative—H. H. Fritts

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4201 South Ashland Ave., Chicago 9, Illinois
Representative—G. W. Trainor

E. I. du Pont de Nemours & Co.
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Jennings Road & Denison Avenue
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Representative—Frank X. Sieloff

Emery Industries, Inc.
4300 Carew Tower, Cincinnati 2, Ohio
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Enjay Company, Inc.
15 West 51st St., New York 19, New York
Representative—Sidney W. Fay

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Representative—W. F. Luckenbach

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Chemical Division, 400 Second Ave. South
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Wallace & Tiernan, Inc.
P. O. Drawer 110, Dover, Ohio
Representative—W. G. McLeod

Harshaw Chemical Company
1945 East 97th Street, Cleveland 6, Ohio
Representative—W. J. Straka

Leffingwell Chemical Company
P. O. Box 191, Whittier, California
Representative—D. E. Murphy

Lithium Corporation of America, Inc.
Rand Tower, Minneapolis 2, Minnesota
Representative—Walter M. Fenton

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Box 3057—Euclid Station, Cleveland 17, Ohio
Representative—John H. Baird

Mallinckrodt Chemical Works
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Representative—C. E. Cosby

N. I. Malmstrom & Company
147 Lombardy St., Brooklyn 22, New York
Representative—Ivar Wm. Malmstrom

The McGean Chemical Company
Micland Building, 101 Prospect Ave.
Cleveland 15, Ohio

Metasap Chemical Corporation
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210 W. Washington Sq., Philadelphia 5, Penn.
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1700 Second Street, St. Louis 4, Missouri
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Representative—Richard Bender

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M. W. Parsons—Plymouth, Inc.
59 Beekman St., New York City 38, New York
Representative—Herbert Bye

Synthetic Products Company
1636 Wayside Rd., Cleveland 12, Ohio
Representative—Garry B. Curtiss

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165th & Indianapolis Blvd., Hammond, Ind.
Representative—F. H. Beneker

Vegetable Oil Products Co., Inc.
Vopcolene Division
5568 East 61st Street, Los Angeles 22, Calif.
Representative—C. F. Williams

Witco Chemical Company
75 East Wacker Drive, Chicago 1, Illinois
Representative—E. F. Wagner

TECHNICAL AND RESEARCH ORGANIZATIONS

Institut Francais du Petrole
CMrR—Courtel, 4 Place Bir Hackeim
Rueil—Malmaison (S. et Oise) France

Les Laboratoires de Recherches Purfina
31 rue de la Loi, Bruxelles, Belgium
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Midwest Research Institute
4049 Pennsylvania, Kansas City 2, Missouri
Representative—Dr. M. H. Thornton

Petroleum Educational Institute
9020 Melrose Avenue, Los Angeles 46, Calif.
Representative—G. A. Zamboni

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3953 W. Shakespeare Ave., Chicago 47, Ill.
Representative—Mrs. G. A. Krawetz

Products Development Laboratory
1 Market St.
West Warwick, Rhode Island

Sociedad Nacional de Petroleos
Rua D. Pedro V, no. 80, Lisbon, Portugal
Representative—Manuel Corda Boullosa